

[54] **WET WIPING PRINthead CLEANING SYSTEM USING A NON-CONTACT TECHNIQUE FOR APPLYING A PRINthead TREATMENT FLUID**

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[56] **References Cited**

U.S. PATENT DOCUMENTS

4,050,078	9/1977	Isayama et al.	347/28
4,306,245	12/1981	Kasugayama et al.	347/33
5,300,958	4/1994	Burke et al.	347/28
5,339,098	8/1994	Nagatomo et al.	347/5
5,396,271	3/1995	Premnath	347/33
5,500,659	3/1996	Curran, Jr. et al.	347/28
5,552,811	9/1996	Kurata et al.	347/28
5,635,965	6/1997	Purwins et al.	347/31
5,706,038	1/1998	Jackson et al.	347/33

FOREIGN PATENT DOCUMENTS

0 465 260 A2	1/1992	European Pat. Off. .
0 513 833 A2	11/1992	European Pat. Off. .
0 671 272 A2	9/1995	European Pat. Off. .

54-133335	10/1979	Japan	347/28
59-14693	1/1984	Japan .	
59-14962	1/1984	Japan .	
59-45162	3/1984	Japan .	
59-45163	3/1984	Japan .	
59-209876	11/1984	Japan .	
2-202452	8/1990	Japan .	
3-90362	4/1991	Japan .	
3-99857	4/1991	Japan .	
4-37556	2/1992	Japan .	
4-338552	11/1992	Japan .	
5-162320	6/1993	Japan .	
6-234221	8/1994	Japan .	

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[57] **ABSTRACT**

A wet-wiping printhead cleaning system including a treatment fluid applicator placing treatment fluid on at least one of two elements involved in wiping, said two elements being a printhead orifice plate surface and a wiper, the system being so configured that treatment fluid is applied before wiping the printhead by projecting treatment fluid onto at least one element through the atmosphere, thereby avoiding direct contact between the applicator and said one element, the treatment fluid being placed so as to be available to assist in wiping a portion of the printhead orifice plate where the nozzle orifices are located to remove debris that may have accumulated, the treatment fluid lubricating the wiper so as to lengthen wiper service life and enhance wiping performance, as well as acting to render such accumulations more removable by wiping, the source of treatment fluid being uncontaminated by contact with either the printhead or the wiper.

14 Claims, 21 Drawing Sheets

